

Football injury helped Highland man fashion a profitable career

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array of braces and splints that are among the most used in the U.S.

By Dallas Scholes
Deseret News staff writer

HIGHLAND — For years, Highland inventor Ed Scott had a hard time admitting his chosen profession. "The name 'inventor' conjures up a very bad image for some people," Scott said.

Instead, he told people he was a physical therapist — just like his bachelor's degree from Brigham Young University and his master's degree from Stanford said he was.

Now, Scott speaks with pride about his inventions. And he has a lot to be proud of. His knee brace, manufactured in Orem, is one of the most widely used braces in the United States.

Scott's inventions began at Brigham Young University. Scott, a native of Salt Lake City, went to BYU to play football. During his freshman year, he hurt his knee and spent time in a knee brace. When Scott transferred to Stanford, he focused his physical therapy studies on knees and invented a knee brace.

After graduation, Scott moved back to Utah, where he worked as a physical therapist at LDS Hospital in Salt Lake City.

Finally, Scott was able to place his first knee brace on a patient.

"It was a BYU football player named Kelly Smith," Scott said.

the (game-winning Holiday Bowl) touchdown pass in 1984 to win the national championship for BYU."

Smith liked the brace so much that he recommended it to friends and Scott left physical therapy to work on his four types of knee braces full time.

But Scott didn't stop at the knees — he also invented an ankle brace, an elbow brace, a shoulder brace and a child's forearm splint.

"I also just invented an exercise machine called the rocker," Scott said. "The rocker is way cool. You ride it, kind of like a horse, and it exercises every muscle group in your body."

He got the idea for the rocker while watching his daughter ride her toy wonder horse.

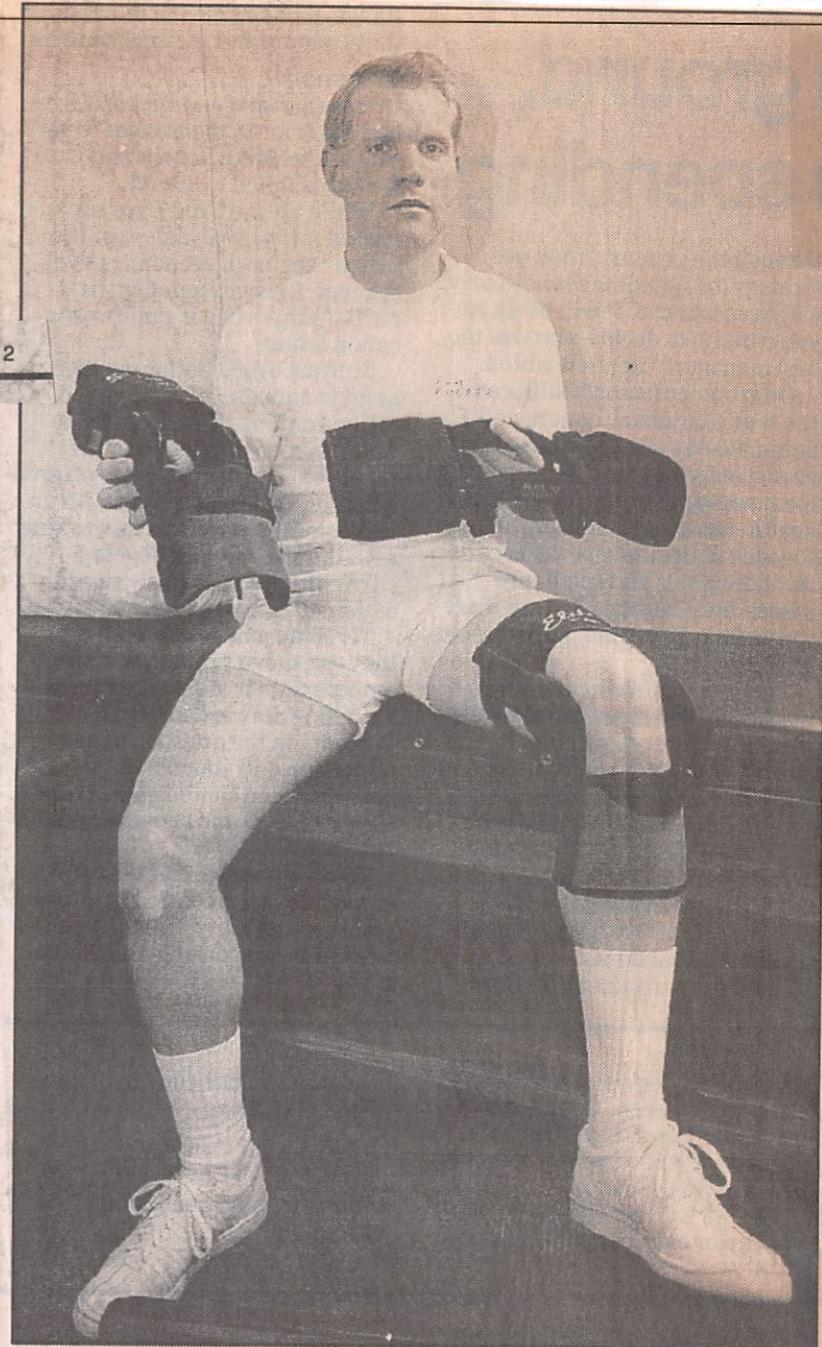
While most stationary exercise machines only move your arms or legs, the rocker gets the whole torso involved.

Scott also spends time helping other inventors produce their ideas. "What I basically do now is called 'Inventor's Network of America.' People bring ideas to me and I work through them and make them salable to manufacturers."

For a share in the royalties, Scott develops a prototype of the idea and makes a video presentation that he sends to manufacturers.

"I have a lot more ideas than I have time to do what I want to do," Scott said.

Some of the ideas Scott recently developed are an underwater



Ed Scott demonstrates one of his latest inventions, a knee exerciser.

weighing system that weighs percentage of body fat, a sprinting machine and a bike rack.

But even inventing is not without its drawbacks.

"There are some people who

spend their whole lives developing an idea and are so sold on it that they get offended when I don't like it," Scott said. "There are a lot of weird people who make inventions."

Patents awarded on 6 Utah inventions

By Barton J. Howell



PATENTS

Four mechanical and two chemical inventions by Utah inventors were awarded patents by the U.S. Patent Office.

• Scott J. Hales and Terry L. Zollinger, both of

Logan. An automatic centering towing device for a snow grooming machine propelled by a vehicle equipped to provide high pressure hydraulic fluid and direct current electrical power. Assigned to Logan Manufacturing Co., Logan. Filed Dec. 27, 1991. Patent 5,142,800.

• Clark N. Harper, Sandy. Load lift truck. Filed May 6, 1991, a con-

tinuation of patent 5,036,952. Patent 5,143,180.

• Brent D. Madsen, Providence. Light-permeable, color-adding, self-securing stressed filters for large display lighting fixtures. Assigned to Integrated Systems Engineering Inc., Logan. Filed Aug. 31, 1990. Patent 5,143,443.

• Fred P. Smith and Fred T.

Smith, both of Alpine. A latching system for a transfer truck and trailer set. Assigned to Superior Trailer Works Inc., Fontana, Calif. Filed Feb. 22, 1991. Patent 5,143,496.

• Robert D. Taylor, Hyrum, and Lewis R. Huntsman, Willard. Additive approach to ballistic and slag melting point control of azide-based nitrogen gas generating compositions. Assigned to Morton

International Inc., Chicago. Filed Aug. 23, 1991. Patent 5,143,567.

• J. Mel Hatch, Murray. Apparatus for shooting dowels into pre-formed cavities in a workpiece. Filed Feb. 23, 1990. Patent 5,143,572.

• Edward V.L. Kalbach, Nibley. Retainer for eyeglasses. Filed May 29, 1990, a continuation of design patent 309,619. Design patent 328,908.

BREAKTHROUGH?

'Cold' fusion may live up to its name

S.L. researcher says his secret method produces energy every time and can even cool objects.

By Joseph Bauman 10/17/92
Deseret News science writer

A Bulgarian researcher who now works in Salt Lake City says he has made a major discovery: cold fusion not only is real, but it can be used to cool objects as well as heat them.

The assertion is made by Kiril Chukanov, who left Sofia, Bulgaria, to work in a lab at Sunnyvale, Calif., and later migrated to Research Park at the University of Utah. Fusion Energy Applied Technology Inc., which sponsors his work, is a private company not affiliated with the U.

Chukanov said he uses a special alloy and secret technology in his experiments. "I can produce energy from cold fusion every time," he said. "And this energy sometimes is very big."

Ever since former University of Utah researchers B. Stanley Pons and Martin Fleischmann announced in 1989 that they had discovered what came to be called "fusion in a jar" — using palladium, deuterium and other material to produce the nuclear energy that powers stars — researchers have been trying to duplicate the process. It remains one of the most-disputed claims in the recent history of science.

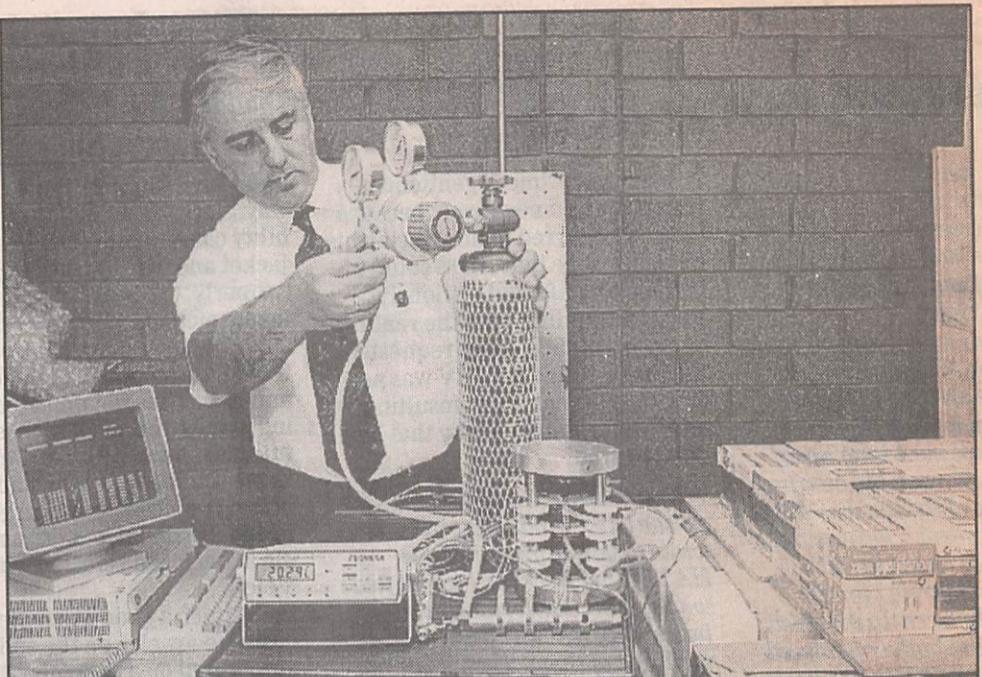
A focus of the dispute are claims and counterclaims about excess heat energy. Now Chukanov says he also gets cooling.

Chukanov says he uses "gas loading" to add hydrogen to his material. "Cold fusion can start a few minutes after the beginning of gas loading," while other researchers must wait days or weeks before noticing any effects.

"I can start cold fusion between a few minutes and a few hours, depending on the alloy," he said.

Some materials will release so much energy, Chukanov added, that an explosion results. "Solid metal becomes powder in a fraction of a second. The temperature of the alloy drops at the moment of the explosion."

It will drop by 15 to 20 degrees Celsius, while at the same time, the temperature of



Kiril Chukanov says he uses a special alloy and secret technology to create fusion in his lab near the U. "I discovered the quantum boundaries of the world," he says.

an object near the alloy will raise 20 to 40 degrees, he said. Chukanov provided a chart of rapid fluctuations in temperature from his experiment, with pulses going from 35 degrees Celsius to below zero within a minute or less.

"From this alloy comes forth a very powerful flow of charged protons, energy about a few kilo-electron-volts."

The charged particles released are absorbed by a light layer, so the process isn't dangerous, he said.

According to Chukanov, his experiments in the related field of ball lightning show that cold fusion is not a result of nuclear reactions, but the action of something called quantum boundaries. He said he has made major discoveries in ball lightning research.

Quantum boundaries, he said, force atoms' protons to move within an alloy. "The hydrogen nucleus begins to move very fast," he said.

The result is a release of energy. "There is violation of the law of conservation of energy," he said. "Cold fusion can produce not only heat, but cold."

He said he made the discovery in his laboratory on Sept. 25. The technology, he believes, could be used to power a new type of refrigerator.

"I can at wish produce positive energy and negative energy, without any input power," he said. "This is very important without any input power."

Chukanov's sparsely furnished laboratory is in the building once occupied by the National Cold Fusion Institute, 390 Wakara Way in Research Park. Although the institute is now defunct, the building still sports a big "NCFI" awning.

Inside, his wife worked at a word pro-

cessor writing a report of his discoveries, to be forwarded to a fusion conference in Nagoya, Japan.

Chukanov showed off lab equipment hooked to a computer. Blocks of household wax, the type used to make paraffin seals for canning, are piled into walls about waist-high. The wax is to block neutrons released in one of his fusion chambers, which is in the center of the wax barricade.

"Inside there are four sensors that measure neutrons. All data are transmitted to this computer," he said. Among the forces measured is temperature, he said.

Chukanov flexed flat metallic disks and said these palladium segments are expensive, and their properties can be used up by fusion. However, he said, he has found a secret material that is much better and can start fusion quickly.

He showed a stack of small disks made of the secret material. They were magnetic and looked similar to the "super-strong rare-earth magnets" sold by Radio Shack at two for \$1.49; they seemed to have the same gritty lead-like texture and color, and held together as if magnetic.

Showing a plastic bag of metallic powder, he said this was the result when material was pulverized in a fusion explosion.

According to Chukanov, cold fusion may be secondary someday to ball lightning as a source of usable energy.

"Ball lightning and cold fusion are the same phenomenon. This is new physics," he said.

"I discovered the quantum boundaries of the world, a new state of matter. If matter reaches these quantum boundaries, ordinary laws of physics are replaced by these quantum boundaries."

DON GRAYSTON, DESERET NEWS

Cold fusion focus shifts to Japan

10-19-92

SALT LAKE CITY (AP) — When the University of Utah announced discovery of the phenomenon known as "cold fusion" nearly four years ago, scientists warned of what might happen if Japan were to take the lead on research.

The worst-case scenario, they said, had its inventors defecting to Japanese corporate giants, the Japanese outspending America on research and, the greatest fear of all, a Japanese success at cold-fusion experiments.

It's almost as if they had a crystal ball, according to a copyright story in Monday's Salt Lake Tribune.

Former University of Utah electrochemist and cold fusion pioneer Stanley Pons has been working in France for a private Japanese research group, Technova.

The Japanese government has put up \$20 million in cold fusion funding and, according to some scientists, the Japanese have made significant progress in harnessing the elusive reaction U. scientists once predicted could change the world.

Japan's central role in cold fusion research will take center stage beginning Wednesday, when it will hold the Third International Conference on Cold Fusion in Nagoya, a city of 2 million in Japan's industrial heartland.

The first conference was held in Salt Lake City in 1990, and the second was last summer in Como, Italy.

"By the time we were into 1991, it was evident the Japanese were playing the leading role, so it was natural it was moved to Japan," Pons told The Tribune in a tele-

phone interview.

But the man who headed the U.S. government's effort to substantiate cold fusion says the evidence on either side of the Pacific is still too thin.

"It turns out there's a small group of people who are completely overrating what's going on in Japan," said John Huizenga, a University of Rochester nuclear chemist and author of "Cold Fusion — The Scientific Fiasco of the Century."

Huizenga says Japanese work contains the same pitfalls that have plagued the research from the beginning: The measurements are inaccurate and the results inconsistent.

Pons and his British colleague, Martin Fleischmann, stunned the scientific world in March 1989 they claimed to have produced a fusion reaction in a table-top experiment at room temperature.

Pons and Fleischmann have since left the university and a fusion research institute at an adjacent research park closed for lack of private funding after two years.

Meantime, Japan's Ministry of International Trade and Industry has committed about \$20 million to cold fusion during the next four years, says Eugene Mallove, a former science writer for the Massachusetts Institute of Technology whose own cold-fusion book, "Fire From Ice," tells a different story.

"Japan is developing this now. ... I can't see how the United States can afford to ignore it," Mallove said.

The debate still has significance for Utah taxpayers who, as owners of the publicly funded university,

have a stake in the patent applications made on the Pons-Fleischmann work.

No patents have been issued and some of the applications have been denied or abandoned, but the university still spends more than \$100,000 annually in legal fees.

Japan's success has been led by Akitio Takahashi, a University of Osaka nuclear engineer whose work still is based roughly Pons' and Fleischmann's original palladium rod-in-a-beaker design.

Takahashi said his experiments are delivering the same kind of results Pons and Fleischmann reported: mysterious discharges of copious amounts of energy.

"Taken at face value, Takahashi's results are more impressive than ours," says Michael McKubre, whose experiments at a private research lab in Menlo Park, Calif., are considered among the most believable in the United States.

Scientists bolster claims of cold fusion success

10-26-92

NAGOYA, Japan (AP) — Cold fusion claims made three years ago by former University of Utah researchers have been bolstered by scientists attending the Third Annual Conference on Cold Fusion here.

Most of the 300 scientists who gathered in this harbor east of Osaka are fervent followers of the idea that heat can be generated by fusing atoms in relatively simple laboratory experiments.

A couple of cold-fusion skeptics spoke to the believers, but didn't win many over, according to a copyright story in the Salt Lake Tribune.

Cold fusion proponents have a growing confidence in the reproducibility of so-called "excess heat."

Earlier attempts often could not reliably control or even predict the heat production, which was first reported by former Utah researchers Stanley Pons and Martin Fleischmann in 1989.

The amounts of that heat are so large it must have a nuclear source, proponents say. If true, cold fusion could become a key energy source.

"It's very clear that there are nuclear phenomena they are seeing," said Hideo Ikegami, an official with Japan's National Institute for Fusion Science who is chairman of the conference.

Scientists at the conference also heard of the emergence of new evidence of helium, a known nuclear-fusion product. That report was made by Nippon Telephone and Telegraph engineer Eiichi Yamaguchi.

Douglas R.O. Morrison, a Scottish physicist who has made a part-

time career of shooting down cold fusion, gave his analysis of the more than 700 scientific papers published on cold fusion, noting that well over half of them found no evidence of nuclear reactions.

"The same laws of physics apply everywhere," Morrison said. "There are no miracles."

But Giuliano Preparata, a University of Milan physicist who has developed a cold-fusion theory, yelled at Morrison for "insulting me with a high-school physics lesson" before storming from the conference hall.

Morrison was besieged by angry scientists after the talk, but he did not back down. "There's no coherence in these results."

But those who claimed to be neutral during the meeting were coming away somewhat impressed.

"I've got to believe there's something interesting going on," said Gus Kohn, a retired chemist from Chevron who came to Nagoya on his own out of curiosity.

"The message I'm taking back is that there seems to be a strong body of orthodox engineers and scientists who are seriously involved," said Michael T. Orillion, an engineer for FMC Corp. in Santa Clara, Calif.

Orillion also noted that there appeared to be some "fringe" science going on.

Those fringes include the so-called "light-water" experiments that use ordinary water rather than heavy water, which has the heavy hydrogen believed necessary for nuclear fusion.

Many U. professors give fusion cold shoulder

SALT LAKE CITY (AP) — Perhaps University of Utah faculty senate chairwoman Sandra C. Taylor's immediate reaction to questions about cold fusion best sums up the school's attitude toward the science.

"Do you have to write about that? Let it be," she said.

It began in 1989 when former electrochemist Stanley Pons and British colleague Martin Fleischmann announced at a press conference they had achieved room temperature, or "cold fusion" in tabletop experiments.

But the initial furor soon gave way to skepticism as researchers were generally unable to duplicate the pair's claims. Physicists derided the project, saying the results should have been published in scientific journals first, not paraded before reporters.

"It was mostly good-natured, but we've all had a lot of fun made of us," said Noel DeNevers, a professor of chemical engineering. "It's been much worse for the physicists and chemists."

"Everywhere I went, I got razed about it ... The razzing has diminished," added physics Professor James Ball.

But cold fusion's legacy lives. The university is pursuing patents for fusion-related research, honoring a contractual obligation to Pons and Fleischmann and to the state, which invested \$5 million into the research.

John Morris, legal counsel to

new university President Arthur K. Smith, said the patenting process has been disappointing. Two of the original dozen applications have been rejected. Several others are "in the pipeline," but likely will be scorned.

"Fundamentally, the patent examiner doesn't believe that scientific literature supports the existence of cold fusion," Morris said. "We believe the examiner has ignored available evidence."

Still, cold fusion apparently has not hindered attempts to secure outside research grants. Research funding went up to \$126 million last school year.

"The University of Utah is too large and complex and substantial of an institution to be affected by one or two controversies. Nothing like (cold fusion) has a long-range negative impact," Morris said.

Ball worries that legislators will feel betrayed by the fusion investment and shy away from future research funding requests.

But Morris said that is unlikely, adding that a university should "provide an environment in which controversial ideas can be discussed and tested."

DeNevers said "tested" is the key word.

"You make sure you know what you're talking about before you call a press conference. You make sure you can run the experiment the same. You get good journals, the ones with peer review, to accept and publish your findings."

Pons says Utah experience painful, but he and family miss old home

SALT LAKE CITY (AP) — Skepticism in America's scientific community contributed to cold fusion researcher Stanley Pons' exodus from Utah to France, but he still misses his old home.

It was 3½ years ago that Pons and British colleague Martin Fleischmann announced they had achieved room-temperature, or "cold" fusion in experiments at the University of Utah.

On Sunday, he spoke to 300 scientists gathered in Nagoya, Japan, for the Third Annual Conference on Cold Fusion. He and Fleischmann showed a videotape of their latest work in which cold fusion cells get so hot they boil off the heavy water, bringing cheers from the crowd.

"We're back almost to what you might say is the beginning of a normal research project," Pons said.

Now 49, he conducts his research in France under the sponsorship of a Japanese company. But "very few days go by that my wife or I don't miss Utah," he said in a copyright interview published Monday by The Salt

Lake Tribune.

Pons left Utah in late 1990 when he sold his house, ending roughly a year of attacks by skeptical physicists and other researchers unhappy he and Fleischmann would not reveal all of their experimental secrets.

Pons adopted a siege mentality, alienating even those people who had been friends and confidants. He recalls a colleague in the U of U chemistry department telling him that most of the staff wanted him to leave.

"That being fair enough, I chose at that point not to be cooperative or try to sell something that would not sell," Pons said.

His wife, Sheila, says the couple still have friends in Utah that they haven't spoken to in years.

"I knew it would be hard, but I didn't think I would have to give up my home and life in Salt Lake City," she said.

The attention, even that which was favorable, was always a discomfort to her husband, who preferred tinkering in the chemistry lab to working in the family business.

"He never liked to be before a

camera," said Mrs. Pons, his third wife and the mother to his two youngest children. "I only had about six or seven photos of him before this happened."

Fleischmann says it was much easier for him to weather the storm. The 65-year-old prize-winning electrochemist had already retired.

"It was terrible, just terrible for him, but I think he coped very well," Fleischmann said.

He said the ordeal has made his colleague "more concentrated, more focused."

Pons says he has relived their decision to announce the fusion findings at a news conference "a thousand times," but in the end he doesn't think it mattered how word got out. Critics said he should have published his findings in scientific journals first.

The aftermath of the announcement was a protracted battle over the validity of their claims that often had little to do with science.

"People protected us. We tried to protect other people. It was really a sorry mix-up in some very low-grade politics," Pons said.